

### REMARKS

Claims 1-21 are pending. Claims 1-8 and 21 are rejected under 35 U.S.C. § 112, second paragraph. Claims 1-21 are rejected under 35 U.S.C. § 103(a). Claims 1-2, 8-9, 12-15, 18, and 20-21 are currently amended.

Claims 1-8 are rejected under 35 U.S.C. § 112, second paragraph. Examiner states that claim 1 discloses an RF receiver apparatus comprising "a mixing circuitry, and analog IF-to-digital baseband converter, and a baseband processing apparatus." Applicants respectfully disagree. Neither original claim 1 nor claim 1, as amended, recite an RF receiver apparatus comprising a baseband processing apparatus. Applicants have amended claim 1, however, for clarification. Thus, claims 1-7 are patentable under 35 U.S.C. § 112, second paragraph.

Claim 8 is further rejected under 35 U.S.C. § 112, second paragraph, for lacking antecedent basis for "said serial formatted digital baseband signal." Applicants have amended claim 8 to recite "The apparatus of Claim 1, wherein said analog IF-to-digital baseband converter produces said digital baseband signal in parallel format, and including a parallel-to-serial converter connected between said analog IF-to-digital baseband converter and said output, said parallel-to-serial converter providing a *serial formatted digital baseband signal* to said output." (emphasis added). Thus, claim 8, as amended, is patentable under 35 U.S.C. § 112, second paragraph.

Claim 21 is rejected under 35 U.S.C. § 112, second paragraph, for lacking antecedent basis for "said receiving step." Applicants have amended claim 21 to depend from independent claim 20. Thus, claim 21, as amended, is patentable under 35 U.S.C. § 112, second paragraph.

Independent claims 1, 9, 13, 18, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathe (U.S. Pat. No. 6,243,430) in view of Tröster et al., An Interpolative Bandpass Converter on a 1.2- $\mu$ m BiCMOS Analog/Digital Array, VOL. 28, NO. 4, 471-477 (April

1993). Claim 1 is amended to recite "An RF receiver apparatus, comprising: *mixing circuitry formed on a first integrated circuit* for mixing an analog RF signal down to an analog IF signal; *an analog IF-to-digital baseband converter formed on said first integrated circuit* and coupled to said mixer for converting said analog IF signal into a digital baseband signal." Claim 9 is amended to recite "A baseband processor apparatus, comprising: an input for receiving a digital baseband signal from an RF receiver apparatus, said RF receiver apparatus comprising *mixing circuitry formed on a first integrated circuit* for mixing an analog RF signal down to an analog IF signal and *an analog IF-to-digital baseband converter formed on the first integrated circuit* and coupled to receive said analog IF signal." Claim 13 is amended to recite "A communication receiver, comprising: an RF receiver apparatus including mixing circuitry for mixing an analog RF signal down to an analog IF signal, an analog IF-to-digital baseband converter coupled to said mixer for converting said analog IF signal into a digital baseband signal, and an output coupled to said analog IF-to-digital baseband converter for outputting said digital baseband signal, *said RF receiver apparatus formed on a first integrated circuit.*" Claim 18, as amended, recites "A method of using *an RF receiver apparatus formed on an integrated circuit*, comprising: *mixing an analog RF signal* down to an analog IF signal within the RF receiver apparatus; *converting the analog IF signal into a digital baseband signal within the RF receiver apparatus.*" Claim 20, as amended, recites "A method of operating *a baseband processor apparatus formed on a second integrated circuit*, comprising: *receiving a digital baseband signal from an RF receiver apparatus formed on a first integrated circuit.*" (emphasis added). Neither Mathe nor Tröster et al., taken alone or in combination, disclose the foregoing emphasized limitations. Thus, independent claims 1, 9, 13, 18, and 20 and their respective depending claims are patentable over Mathe in view of Tröster et al. under 35 U.S.C. § 103(a).

Examiner has rejected depending claims 2, 12, 15, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Mathe in view of Tröster et al. in further view of Elder et al. (U.S. Pat. No. 6,167,246). Examiner concedes Mathe in view of Tröster et al. does not disclose the RF receiver apparatus to be provided as an integrated circuit. (OA, 9/21/2004, page 8). Examiner states Elder et al. disclose a single chip fully integrated super heterodyne receiver. However,

Examiner fails to offer any rationale for combining the disclosure of Elder et al. with that of Mathe and Tröster et al. to produce the claimed invention. A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Here, there can be no teaching or suggestion to combine Elder et al. with either Mathe or Tröster et al. apart from improper hindsight in view of the instant specification. Mathe specifically teaches away from integration of an RF front end (202) and demodulator (204) at

Figure 2. Therein, Mathe shows the RF front end (202) and demodulator (204) as separate entities within respective blocks. Tröster et al. disclose an analog-to-digital converter, but fail to teach or suggest that it might be integrated in a single circuit with an RF front end. The CMOS AM receiver of Elder et al. is a completely different application with different bandwidth and demodulation requirements than either Mathe or Tröster et al. Furthermore, Elder et al. fail to teach or suggest advantages of the present invention as disclosed in the instant specification. For example, Elder et al. fail to teach or suggest advantages of an enhanced frequency plan for the RF receiver (page 7, lines 6-13), reduced clock generation complexity (page 8, lines 8-10), reduced connection complexity with serial transmission between the RF front end and the baseband processor (page 9, lines 5-8), reduced sampling clock complexity (page 9, lines 11-15), or a lower sampling rate advantageously reducing power consumption (page 10, lines 4-7). Applicants respectfully submit, therefore, that one of ordinary skill in the art at the time of the invention would not think to combine the teaching of Elder et al. with the disclosure of Mathe and Tröster et al. to produce the claimed invention. Thus, claims 1-21, as amended, are patentable under 35 U.S.C. § 103(a).

In view of the foregoing, applicants respectfully request reconsideration and allowance of claims 1-21, as amended. If the Examiner finds any issue that is unresolved, please call applicants' attorney by dialing the telephone number printed below.

Respectfully submitted,



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